FORMER FORT DEVENS ARMY INSTALLATION PROJECT STATUS UPDATE

September 2020

U.S.ARMY

US Army Corps of Engineers®

AGENDA

Per- and Polyfluoroalkyl Substances (PFAS) Investigation and Sampling Updates

- Community Involvement Plan
- Sampling results for private drinking water wells and community/non-community systems
- Sampling results for municipal water supply wells
- Municipal water supply well treatment
- Remedial Investigation (RI)

COMMUNITY INVOLVEMENT PLAN

Describes the Army's community outreach program regarding the ongoing environmental investigations at Fort Devens.

Draft CIP
– Submitted for review to 100 stakeholders

Schedule
– Draft CIP issued Dec. 19 (completed)
– Public review period until Mar. 9 (completed)
– Response to comments May 26 (completed)
– Draft Final CIP planned for September
– Final CIP planned for November

US Army Corps of Engineers®

Community Involvement Plan
Investigation of Per- and Poly- Fluoroalkyl Substances (PFAS)
Environmental Restoration Program

Former Fort Devens, Massachusetts

DRAFT
DECEMBER 2019

Prepared by:
KOMAN Government Solutions, LLC
and
Jacobs Engineering Group, Inc.
CONTRACT NO. W912WJ-18-C-0011

SAMPLING UPDATE FOR COMMUNITY/ NON-COMMUNITY SYSTEMS AND PRIVATE WELLS

Army has been sampling nearby drinking water wells since 2018 out of an abundance of caution

Regulatory benchmarks

– 2016 EPA Lifetime Health Advisory (LHA) guidance value for drinking water is 70 ppt (sum of PFOS, PFOA)

– December 2019 MassDEP proposed maximum contaminant level (MCL) for drinking water is 20 ppt (sum of PFOS, PFOA, PFHpA, PFHxS, PFNA, PFDA)

– 2020 MassDEP GW-1 standard for groundwater is 20 ppt (sum of PFOS, PFOA, PFHpA, PFHxS, PFNA, PFDA)

– January 2020 MassDEP Office of Research and Standards Guideline (ORSG) guidance value for drinking water is 20 ppt (sum of PFOS, PFOA, PFHpA, PFHxS, PFNA, PFDA)

SAMPLING UPDATE FOR COMMUNITY/ NON-COMMUNITY SYSTEMS AND PRIVATE WELLS

2018 (summer) – Sampled 21 wells in Shirley & Harvard
– PFAS detected in some wells, but below EPA's LHA of 70 ppt and the Mass. 2018 ORSG of 70 ppt for the sum of PFOS, PFOA, PFHpA, PFHxS, PFNA
– Source of PFAS in the wells is uncertain based on hydrogeology

2018-2020 – Quarterly sampling of water supply wells in Ayer and Devens

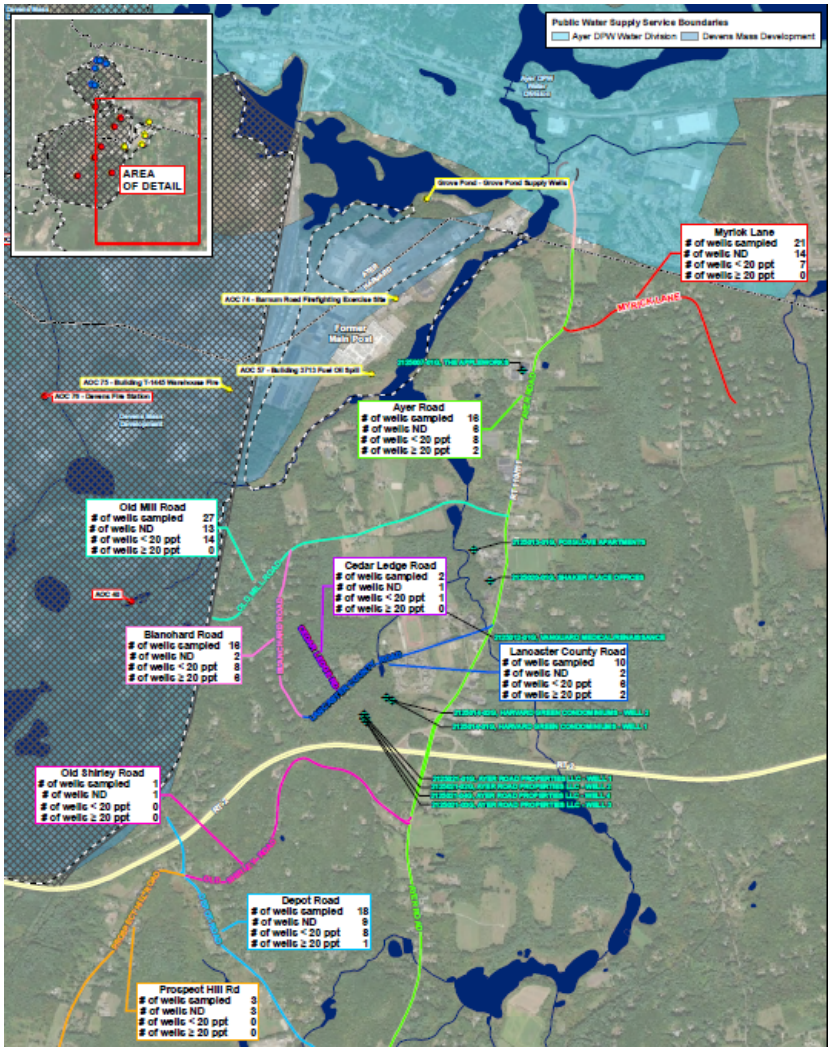
2019 (spring) – Follow-up sampling of 3 locations in Harvard and sampling 1 location quarterly

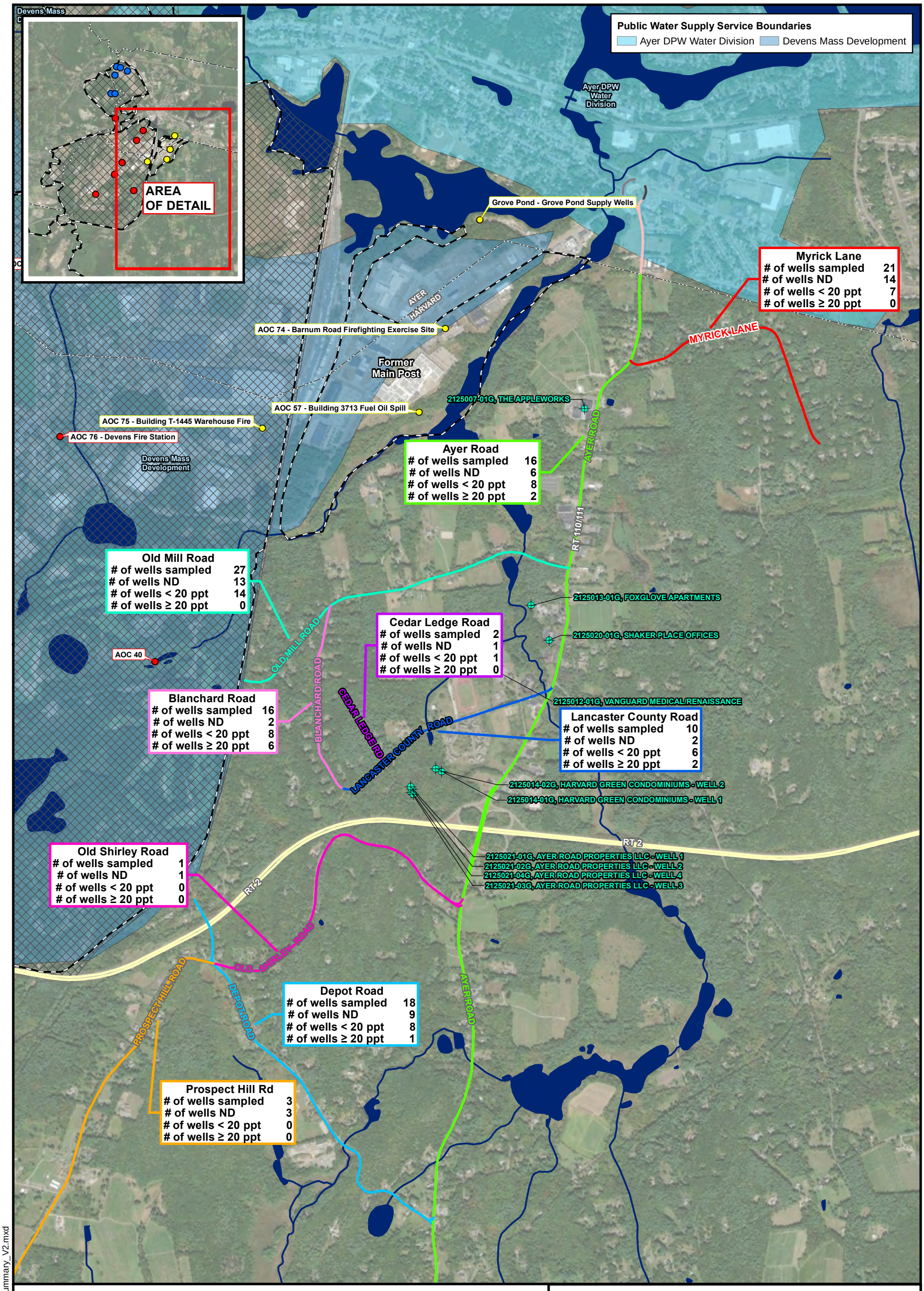
Oct. 2019 to June 2020 – Sampling requested by Harvard Board of Health
– Army contacted 196 well owners in Harvard in September 2019
– 114 wells were sampled between October 2019 and June 2020
– Resampled selected wells that had previous detections above MassDEP ORSG for PFAS

RESULTS OF SAMPLING OF WELLS IN HARVARD

Harvard Private Well PFAS Results Summary Breakdown				
Location	Number of Wells Sampled	Number Exceeding 20 ppt	Number Detects <20 ppt	Number of Non-Detects
Myrick Lane	21	0	7	14
Ayer Rd	16	2	8	6
Old Mill Rd	27	0	14	13
Blanchard Rd	16	6	8	2
Cedar Ledge Rd	2	0	1	1
Lancaster Cty Rd	10	2	6	2
Old Shirley Rd	1	0	0	1
Depot Rd	18	1	8	9
Prospect Hill Rd	3	0	0	3
Subtotals	**114**	**11**	**52**	**51**

No results exceeded the EPA LHA of 70 ppt





Legend

- Select Public Supply Well
- Area 1 - Grove Pond Supply Wells, AOCs 57, 74, and 75 to be addressed in the RI
- Area 2 - MacPherson Water Supply Well, SHL, AOCs 32, 76, 43G and 43J to be addressed in the RI
- Area 3 - AOCs 20, 21, 30, 31, and 50 to be addressed in the RI

ppt parts per trillion
ND Not Detected

- Devens - Census Designated Place
- City/Town Boundary
- National Hydrography Dataset Waterbody
- National Hydrography Dataset Stream/River
- Former Fort Devens Boundary

Notes:
Proposed MassDEP PFAS (6) MCL is 20 ppt

2019 and 2020 Summary of PFAS Results for Private Wells Sampled in Harvard, Massachusetts

Former Army Installation Devens
Devens, Massachusetts

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293 Boston Post Road West, Suite 100, Marlborough, MA 01752

0 750 1,500
Feet

Date: 07/08/2020

Figure 1

File: RAB2020_HarvardPrivWells_PFASSummary_V2.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

WELL SAMPLING UPDATE FOR COMMUNITY/NON-COMMUNITY SYSTEMS AND PRIVATE WELLS

2020 – Sampling of private wells in Ayer and Shirley

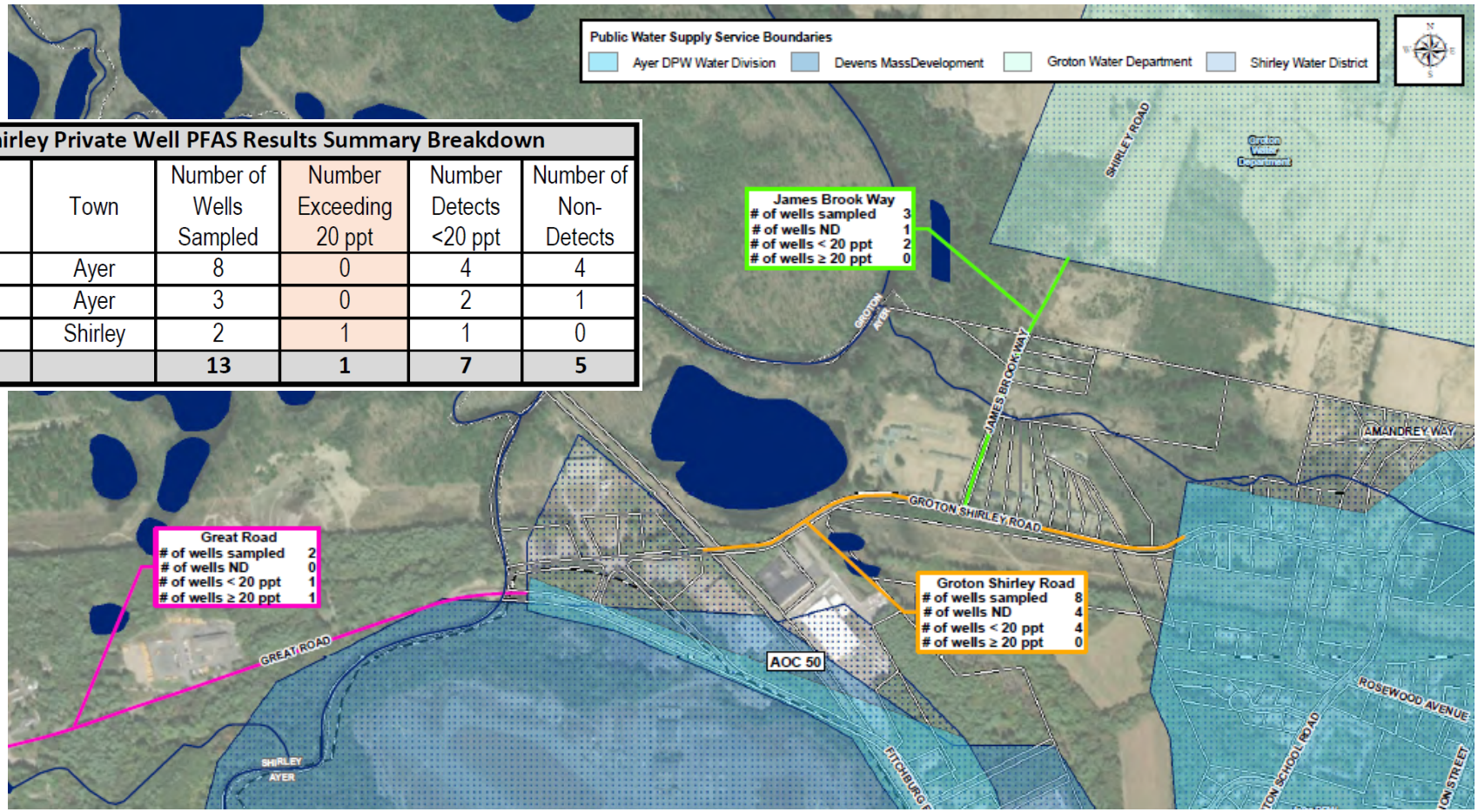
– Located north and west of the former Army Airfield

– Army contacted 16 Ayer and 4 Shirley well owners in January 2020

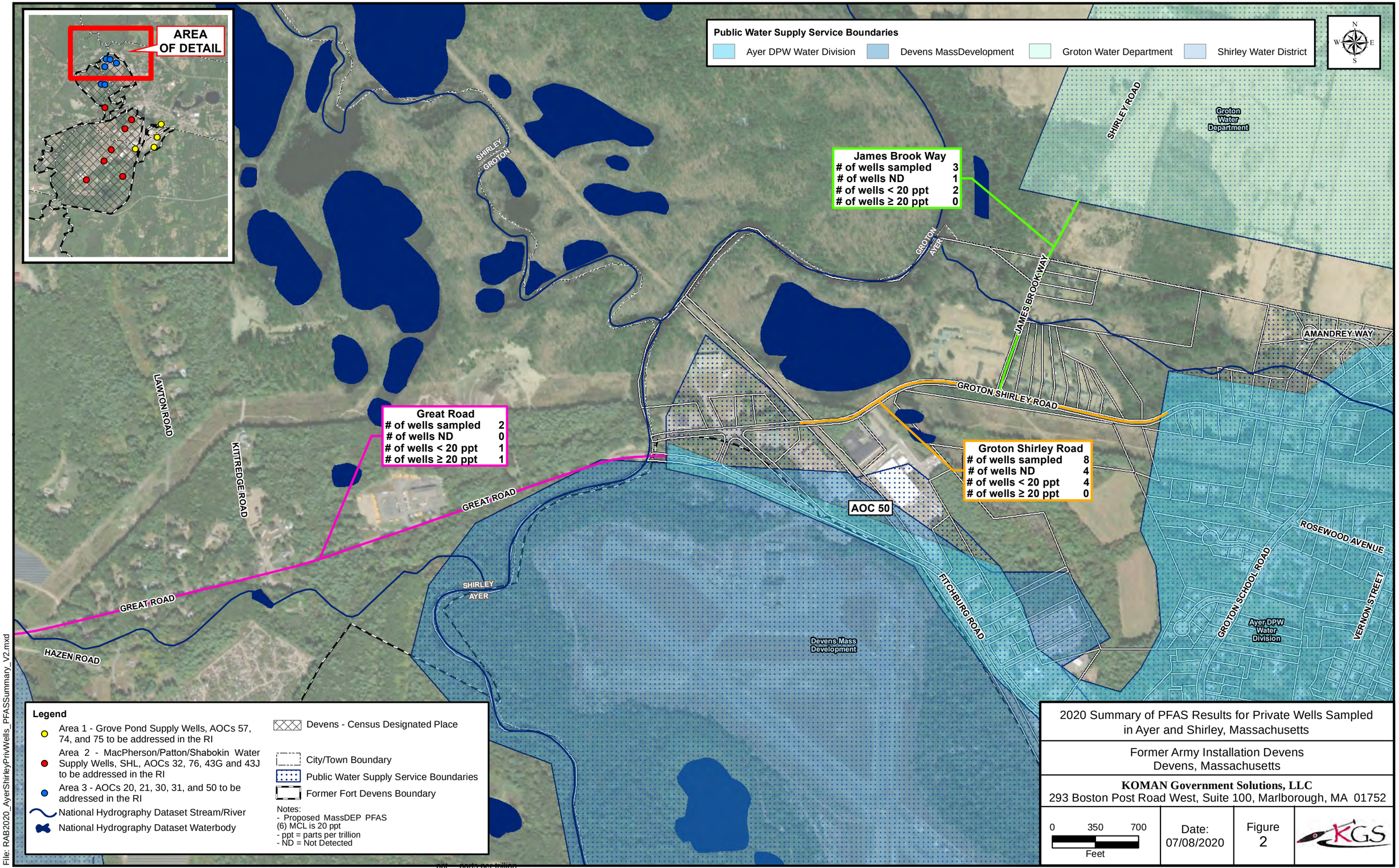
– 13 wells were sampled between February and June 2020

WELL SAMPLING RESULTS IN AYER AND SHIRLEY

Ayer/Shirley Private Well PFAS Results Summary Breakdown					
Location	Town	Number of Wells Sampled	Number Exceeding 20 ppt	Number Detects <20 ppt	Number of Non-Detects
Groton Shirley Rd	Ayer	8	0	4	4
James Brook Way	Ayer	3	0	2	1
Great Rd	Shirley	2	1	1	0
Subtotals		**13**	**1**	**7**	**5**



No results exceeded the EPA LHA of 70 ppt



File: RAB2020_AyerShirleyPrivWells_PFASSummary_V2.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

SAMPLING OF MUNICIPAL (AYER) WATER SUPPLY WELLS DETECTIONS OF PFAS, JUNE 2020

	Grove Pond Wells (ppt)						Spectacle Pond Wells (ppt)		
	Well 1	Well 6	Well 7	Well 8 (pre-treatment)	Well 8 (post-treatment)	Finished Water (wells 1,6,7,8)	Well 1A	Well 2A	Finished Water (wells 1A, 2A)
	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020
PFBS (unreg.)	1.60 J	1.91	2.29	3.52	ND	1.24 J	1.88	2.04	1.73 J
PFHxA (unreg.)	ND	4.68	44.0	106	ND	18.0	2.71	20.1	11.3
PFHpA	1.05 J	2.16	33.2	81.9	ND	14.0	1.44 J	7.13	4.35
PFHxS	4.87	4.68	8.92	23.5	ND	4.56	3.57	2.22	2.58
PFOS	3.67	3.52	14.9	51.7	ND	5.75	5.85	7.06	6.24
PFOA	6.87	7.34	33.2	65.6	ND	14.1	6.64	9.28	8.12
PFNA	0.654 J	0.576 J	1.40 J	1.94 J	ND	0.618 J	0.469 J	0.983 J	0.775 J
PFDA	ND	ND	0.609 J	ND	ND	ND	ND	ND	ND
EPA LHA (70)	10.5	10.9	48.1	117	ND	19.9	12.5	16.3	14.4
Mass ORSG/ MCL (20)	17.1	18.3	92.2	225	ND	39.0	18.0	26.7	22.1

Results show the detected PFAS out of 18 analytes tested.

Yellow shading shows concentrations above the EPA LHA (Lifetime Health Advisory) (PFOS, PFOA of 70 ppt) and/or Massachusetts ORSG (Office of Research and Standards Guideline) for drinking water and the Massachusetts maximum contaminant level (MCL) for drinking water (PFOS, PFOA, PFHpA, PFNA, PFHxS of 20 ppt).

ND = non-detect, J = estimated value

SAMPLING OF MUNICIPAL (AYER) WATER SUPPLY WELLS DETECTIONS OF PFAS, FEBRUARY 2020

Grove Pond Wellfield

- Water from Well 8 is treated using a carbon filter. Pre- and post-treatment samples are collected. The water is treated for PFAS before the water is combined with water from the other wells. The results from the Finished Water represent the combined water flow (wells 1, 6, 7, 8) that is entering the municipal water system for public use.

Spectacle Pond Wellfield

- The PFAS impacts at these wells are not attributed to the Army.
- The town of Ayer is pursuing treatment for PFAS at these wells and is working with MassDEP to investigate the potential source of PFAS at these wells.

UPDATE ON GROVE POND WELLFIELD - TIME CRITICAL REMOVAL ACTION (TCRA)

Ongoing <u>temporary</u> treatment of Well #8 using granular activated carbon (GAC)

- On-line since June 2019; pumping approximately 200 to 300 gpm; over 135M gallons treated to date
- Winterized in November 2019
- Well #8 raw water was 277 ppt for the 6 OSRG PFAS compounds in June 2020
- Treated Well #8 water was non-detect (ND) for the 6 OSRG PFAS compounds in June 2020

UPDATE ON GROVE POND WELLFIELD - ENVIRONMENTAL SERVICES COOPERATIVE AGREEMENT (ESCA)

Supported by federal ESCA grant ~ $4.4M signed September 5, 2019

Permanent upgrade to Grove Pond Water Treatment Plant – New Ion Exchange (IX) System

- Installation of IX begun: Sept. 2019
- Anticipated completion: Fall 2020
- Will treat up to 2 million gallons per day

MASSDEVELOPMENT SAMPLING OF DEVENS WATER SUPPLY WELLS FOR PFAS

	MacPherson Well (raw)	MacPherson Well (treated)	Patton Well (raw)	Patton Well (treated)	Shabokin Well (raw)	Shabokin Well (treated)
	6/17/2020	6/17/2020	5/13/2020	6/10/2020	6/24/2020	6/24/2020
PFHxA (unreg.)	--	2.8	--	1.64	--	ND
PFHpA	14	ND	3.99	ND	1.35	ND
PFHxS	47.3	0.56	5.94	ND	11.9	ND
PFOS	40.8	ND	3.37	ND	5	ND
PFOA	22.5	ND	8.09	ND	4.88	ND
PFNA	2.67	ND	ND	ND	ND	ND
PFDA	ND	ND	ND	ND	ND	ND
EPA LHA (70)	63.3	ND	11.46	ND	9.88	ND
Mass ORSG/ MCL (20)	127.27	0.56	21.39	ND	23.13	ND

Yellow shading shows concentrations above the EPA LHA (Lifetime Health Advisory) (PFOS, PFOA of 70 ppt) and/or Massachusetts ORSG (Office of Research and Standards Guideline) for drinking water and the Massachusetts maximum contaminant level (MCL) for drinking water (PFOS, PFOA, PFHpA, PFNA, PFHxS of 20 ppt).

ND = non-detect

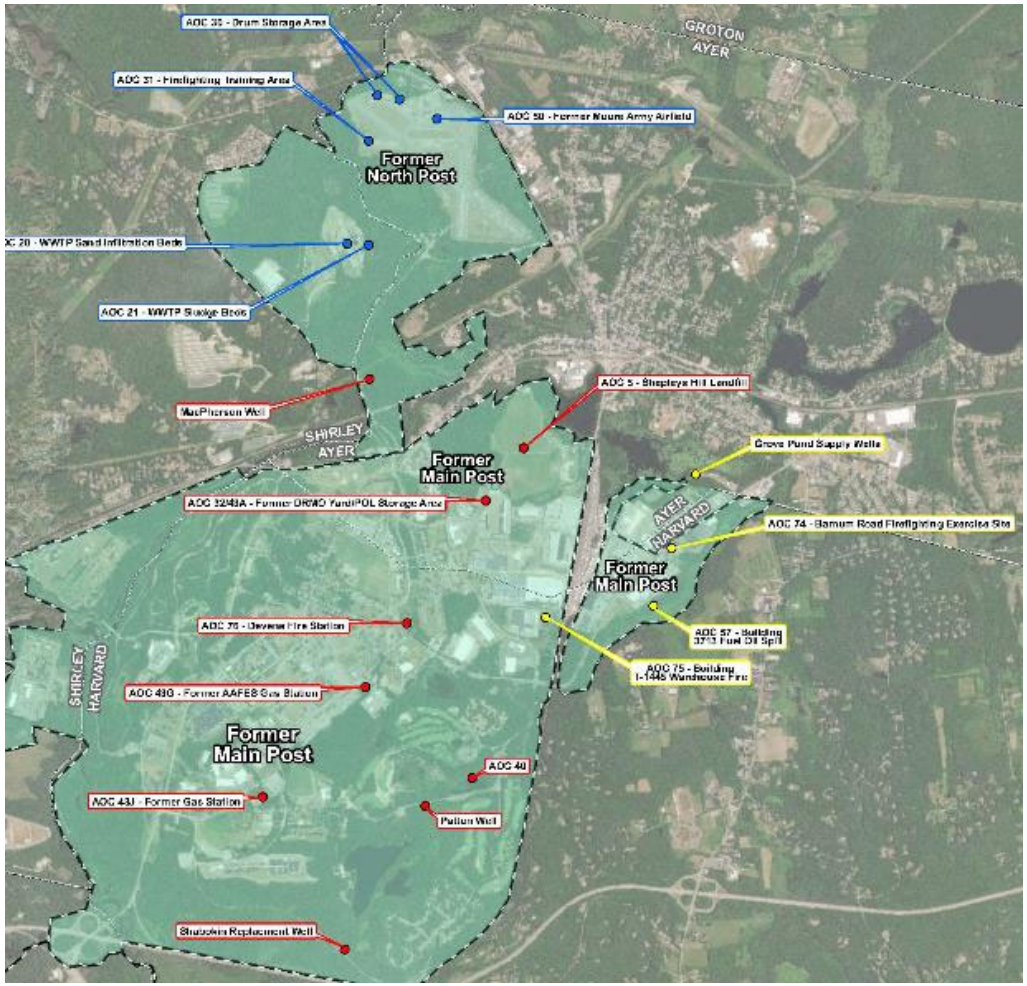
-- = not analyzed/not reported

PFAS RI AREAS OF INVESTIGATION

RI Areas of Investigation – the areas of investigation were divided into Areas 1, 2, and 3 to facilitate mobilizing into the field quicker back in 2018. Each area of investigation is shown on the map within the specified area.

- Area 1 = yellow
- Area 2 = red
- Area 3 = blue

The initial field activities have been completed in the three areas. Additional activities have been identified based on the review of the results and are being conducted.



RECENT PFAS RI DRILLING AND SAMPLING ACTIVITIES

PFAS RI Activities Completed during Jan. 1 to May 15, 2020

- 14 Vertical profiles conducted in Cold Spring Brook wetlands
- 24 Monitoring wells and 17 piezometers installed
- 2 Soil borings conducted
- 43 Existing monitoring wells sampled
- 30 New monitoring wells sampled
- 1 Irrigation well sampled
- 13 Surface water and sediment samples collected
- 1 Staff gauge installed
- 5 Synoptic water level surveys performed

Future PFAS RI Activities Planned in 2020

- Vertical profiles
- Piezometer installation
- Bedrock well installation
- Surface water and sediment sampling

VERTICAL PROFILES CONDUCTED IN COLD SPRING BROOK WETLANDS (MAR.-APR. 2020)

Vertical profiles were conducted within the wetlands on the west side of Cold Spring Brook to gather more information on the extent of PFAS in groundwater at AOC 74, AOC 57 Area 2, AOC 57 Area 3, and AOC 75 beneath the wetlands. ("Vertical profiles" are a one-time sampling of groundwater from multiple depths below ground surface.)

– At AOC 57 Area 2, it was possible to use a drill rig to obtain groundwater profile samples beneath the containment dam in the wetland area
– At AOC 57 Area 3, AOC 74, and AOC 75 it was not possible to use a drill rig without compromising the wetlands. Instead, the drill crew used hand-held equipment to collect groundwater profile samples.
  - The crew used a jack hammer to drive 1.5-inch rods driven into the wetland. Groundwater samples were collected through the rods.
  - The crew waded into the brook/wetland from the shoreline but did not proceed further if the water was deeper than knee height.

The profile results are shown on the following maps, which show the maximum concentration detected at each location regardless of depth.

RESULTS OF VERTICAL PROFILES CONDUCTED IN COLD SPRING BROOK WETLANDS – AOC 75

- Three vertical profiles were conducted starting at the edge of the wetlands. Samples were collected down to 32 and 35 ft below the top of the sediment.
- PFAS concentrations greater than the EPA LHA (70 ppt) and MassDEP GW-1 standard (20 ppt) were observed at all three locations. Concentrations decreased with distance from the shoreline (i.e., toward the center of the brook). The higher PFAS concentrations were shallower with increasing distance from the shoreline. These observations support our understanding that the groundwater from AOC 75 discharges to Cold Spring Brook/wetlands.
- The highest concentrations were detected at sample locations 75VP-20-02 at 8-10 ft below the top of the sediment (PFOA + PFOS = 320 ppt and the sum of the six MassDEP GW-1 standard compounds is 1,010 ppt)

DETAIL

75MW-19-02C
75VP-18-06
75MW-19-02B
75MW-19-02A
SA75-17-02
75MW-19-02BR

DETAIL

75MW-19-04A
75VP-18-11
75MW-19-04B

75VP-18-02
75VP-18-05
75MW-19-02A
75MW-19-02B
75MW-19-02BR
75MW-19-02C
75VP-18-09
75VP-18-08
75VP-18-12
SA75-17-01
75VP-18-06
SA75-17-02
75VP-18-03
75VP-19-08
75VP-19-03
75VP-18-01
SA75-17-03
75VP-19-01
75VP-19-07
75VP-19-04
SA75-17-04
75VP-18-07
75VP-18-04
75VP-20-01
75VP-19-06
75MW-19-01BR
Saratoga Blvd
75VP-19-02
Saratoga St
75VP-18-10
75VP-19-05
Grove Pond Rd
75VP-18-13
75PZ-20-07
75VP-19-09
75VP-18-11
75VP-20-02
75VP-20-03
75VP-20-04
Cold Spring Brook

245 234 233 232 231 228 227 226 225 224 230 223 229

N
W E
S

Legend

- Monitoring Well/Vertical Profiling Location

EPA LHA
(sum of PFOA and PFOS) (ng/L)

- EPA LHA ≥ 70 ng/L
- EPA LHA < 70 ng/L
- EPA LHA No detection

MassDEP
(sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA) (ng/L)

- MassDEP ≥ 20 ng/L
- MassDEP < 20ng/L
- MassDEP no detection
- Groundwater Contour (ft NAVD 88) (Contour Interval = 1 Foot) - March 2020
- Former Fort Devens Boundary

new vertical profiles conducted in the Cold Spring Brook wetlands

Notes:

Samples collected during the PFAS SI (e.g., SA75-17-01 through -04) were not analyzed for PFDA.

MassDEP GW-1 = sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA
MassDEP Exceedance Criteria is defined as equal to or greater than 20 ng/L

EPA LHA (Lifetime Health Advisory) = sum of PFOA and PFOS
EPA LHA Exceedance Criteria is defined as equal to or greater than 70 ng/L

Aerial Source: USGS, MassGIS Orthoimagery 2019

AOC 75 Groundwater Results
Devens PFAS RI - Area 1 PSCS, CSB Addendum

Former Fort Devens Army Installation
Devens, Massachusetts

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0 150 300
Feet

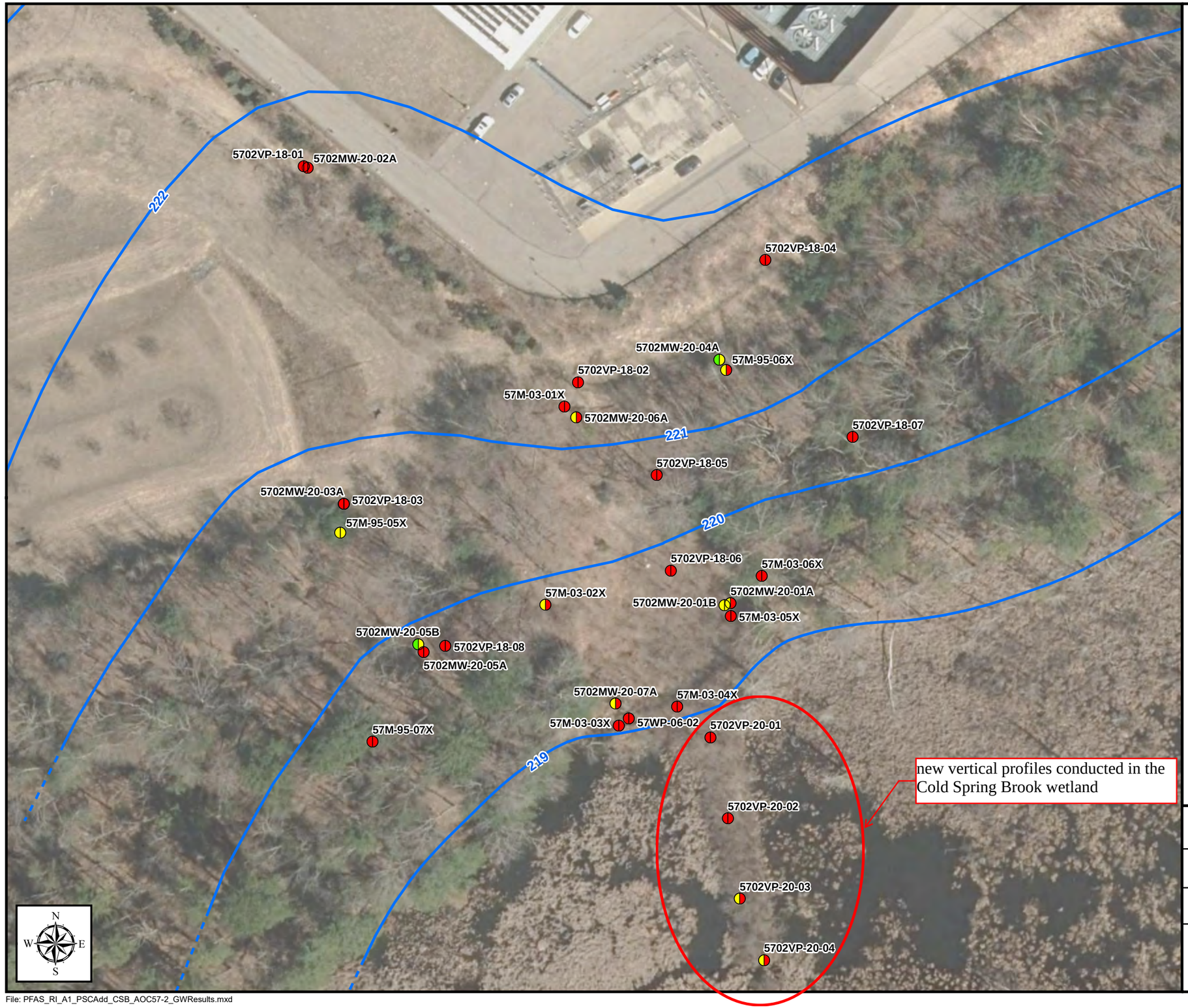
Date: 06/05/2020

Figure 3

File: PFAS_RI_A1_PSCAdd_CSB_AOC75_GWResults.mxd

RESULTS OF VERTICAL PROFILES CONDUCTED IN COLD SPRING BROOK WETLANDS – AOC 57 AREA 2

- Four vertical profiles were conducted on the containment dam starting at the edge of the wetlands. Samples were collected down to 52 to 54 ft below the top of the dam. PFAS concentrations greater than the EPA LHA were observed at two locations and greater than the MassDEP GW-1 standard at all four locations.
- The highest concentrations were detected at 5702VP-20-02 at 10-14 ft below the top of the sediment (PFOA + PFOS = 769 ppt, the sum of the six MassDEP GW-1 standard compounds is 1,990 ppt).
- Concentrations were lowest at the location farthest from the shoreline (closest to the center of the brook).The highest concentrations in each profile became shallower with increasing distance as the profiles approached the center of the brook. These observations support our understanding that the groundwater from AOC 57 Area 2 is discharging to the brook/wetland.
- Upward vertical gradients measured in monitoring wells and piezometers at the shoreline also support our understanding that groundwater at AOC 57 Area 2 discharges to the brook/wetland.



Legend

- Monitoring Well/Vertical Profiling Location

EPA LHA
(sum of PFOA and PFOS) (ng/L)

- EPA LHA ≥ 70 ng/L
- EPA LHA < 70 ng/L
- EPA LHA No detection

MassDEP
(sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA) (ng/L)

- MassDEP ≥ 20 ng/L
- MassDEP < 20ng/L
- MassDEP no detection
- Shallow Groundwater Contour - March 2020 (ft NAVD88) (Contour Interval = 1 ft)
- Inferred Shallow Groundwater Contour - March 2020 (ft NAVD88) (Contour Interval = 1 ft)

Notes:

MassDEP GW-1 = sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA
MassDEP Exceedance Criteria is defined as equal to or greater than 20 ng/L

EPA LHA (Lifetime Health Advisory) = sum of PFOA and PFOS
EPA LHA Exceedance Criteria is defined as equal to or greater than 70 ng/L

Aerial Source: USGS, MassGIS Orthoimagery 2019

AOC 57 Area 2 Groundwater Results
Devens PFAS RI - Area 1 PSCS, CSB Addendum

Former Fort Devens Army Installation
Devens, Massachusetts

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0 30 60
Feet

Date: 06/05/2020

Figure 4

File: PFAS_RI_A1_PSCAdd_CSB_AOC57-2_GWResults.mxd

RESULTS OF VERTICAL PROFILES CONDUCTED IN COLD SPRING BROOK WETLANDS – AOC 57 AREA 3

- Four vertical profiles were conducted starting at the edge of the wetlands. Samples were collected down to 32 and 37 ft below the top of the sediment. None of the locations had PFAS concentrations greater than the EPA LHA. Three locations had concentrations greater than the MassDEP GW-1 standard.
- The highest concentrations were detected at 5703VP-19-01 at 30-32 ft below the top of the sediment (PFOA + PFOS = 28.0 ppt, the sum of the six MassDEP GW-1 standard compounds is 93.9 ppt).
- Concentrations decreased with distance from the shoreline (i.e., toward the center of the brook) and higher concentrations became shallower with increasing distance from the shoreline. Both of these observations support our understanding that the groundwater from AOC 57 Area 3 discharges to the brook/wetlands.
- Upward vertical gradients measured in monitoring wells and piezometers at the shoreline support our understanding that groundwater at AOC 57 Area 3 is discharging to the brook/wetlands.

Legend

- Monitoring Well/Vertical Profiling Location

EPA LHA
(sum of PFOA and PFOS) (ng/L)

- EPA LHA ≥ 70 ng/L
- EPA LHA < 70 ng/L
- EPA LHA No detection

MassDEP
(sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA) (ng/L)

- MassDEP ≥ 20 ng/L
- MassDEP < 20ng/L
- MassDEP no detection
- Shallow Groundwater Contour - March 2020 (ft NAVD88) (Contour Interval = 1 ft)
- Inferred Shallow Groundwater Contour - March 2020 (ft NAVD88) (Contour Interval = 1 ft)

Notes:

MassDEP GW-1 = sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA
MassDEP Exceedance Criteria is defined as equal to or greater than 20 ng/L

EPA LHA (Lifetime Health Advisory) = sum of PFOA and PFOS
EPA LHA Exceedance Criteria is defined as equal to or greater than 70 ng/L

Aerial Source: USGS, MassGIS Orthoimagery 2019

AOC 57 Area 3 Groundwater Results
Devens PFAS RI - Area 1 PSCS, CSB Addendum

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Devens, Massachusetts

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0 30 60
Feet

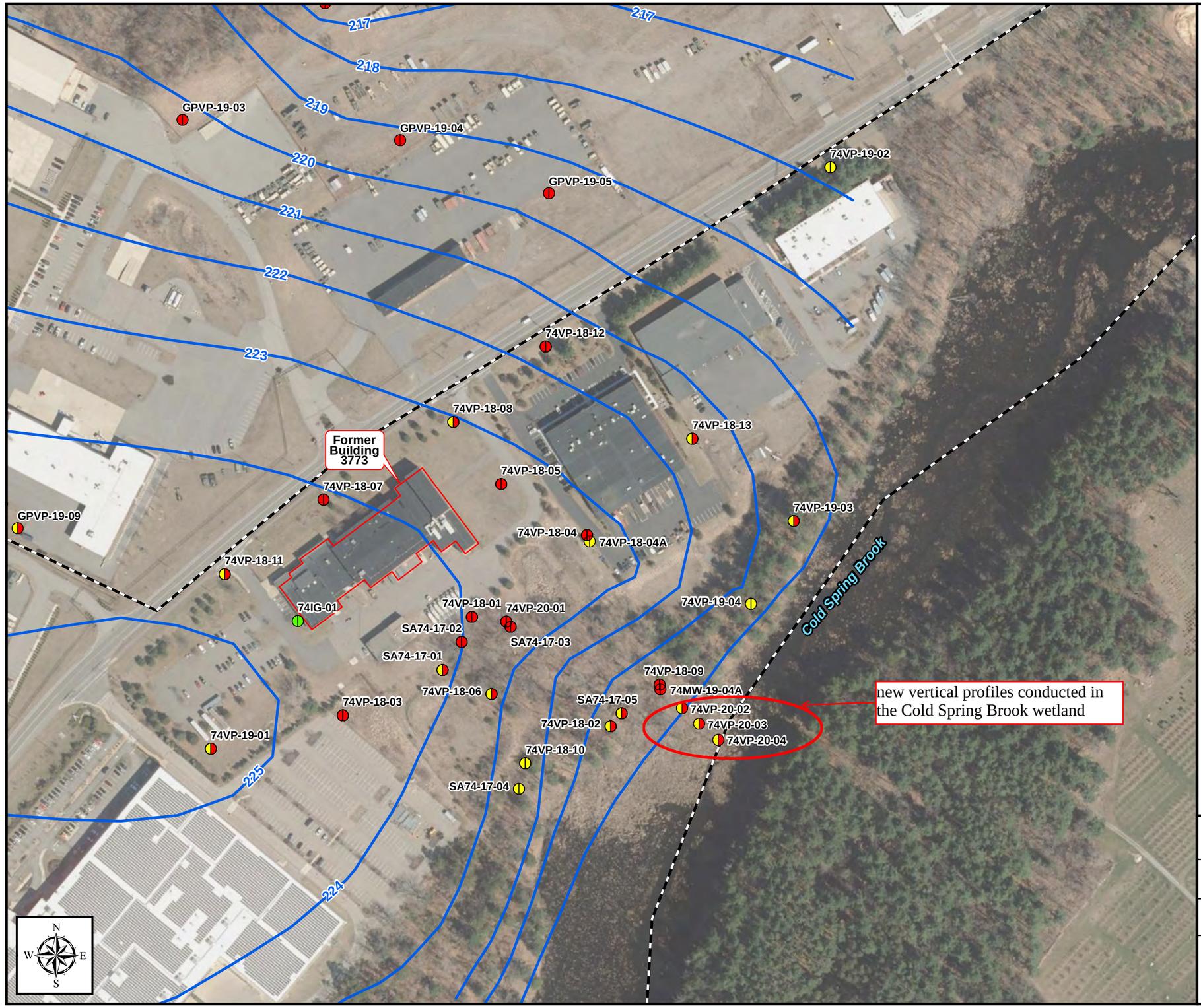
Date: 06/05/2020

Figure 5

File: PFAS_RI_A1_PSCAdd_CSB_AOC57-3_GWResults.mxd

RESULTS OF VERTICAL PROFILES CONDUCTED IN COLD SPRING BROOK WETLANDS – AOC 74

- Three vertical profiles were conducted starting at the edge of the wetlands. Samples were collected down to 27 to 37 ft below the top of the sediment. None of the locations had PFAS concentrations greater than the EPA LHA. All three locations had concentrations greater than the MassDEP GW-1 standard.
- Concentrations were lowest at the location farthest from shore and higher concentrations became shallower with increasing distance from the shoreline. Both of these observations support our understanding that the groundwater from AOC 74 is discharging to the brook/wetland.
- The highest concentrations (PFOA + PFOS = 68.4 ppt, the sum of the six MassDEP GW-1 standard compounds is 102 ppt) were detected at 74VP-20-03 at 15-17 ft below the top of the sediment.
- Upward vertical gradients measured in monitoring wells and piezometers at the shoreline support our understanding that groundwater at AOC 74 is discharging to the brook/wetland.



Legend

- Monitoring Well/Vertical Profiling Location

EPA LHA
(sum of PFOA and PFOS) (ng/L)

- EPA LHA ≥ 70 ng/L
- EPA LHA < 70 ng/L
- EPA LHA No detection

MassDEP
(sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA) (ng/L)

- MassDEP ≥ 20 ng/L
- MassDEP < 20ng/L
- MassDEP no detection
- Groundwater Contour (ft NAVD 88)
  (Contour Interal = 1 Foot) - March 2020
- Former Fort Devens Boundary

Notes:

Samples collected during the PFAS SI (e.g., SA74-17-01 through -05) were not analyzed for PFDA.

MassDEP GW-1 = sum of PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA
MassDEP Exceedance Criteria is defined as equal to or greater than 20 ng/L

EPA LHA (Lifetime Health Advisory) = sum of PFOA and PFOS
EPA LHA Exceedance Criteria is defined as equal to or greater than 70 ng/L

Aerial Source: USGS, MassGIS Orthoimagery 2019

AOC 74 Groundwater Results
Devens PFAS RI - Area 1 PSCS, CSB Addendum

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Devens, Massachusetts

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0 100 200
Feet

Date: 06/05/2020

Figure 6

File: PFAS_RI_A1_PSCAdd_CSB_AOC74_GWResults.mxd

SURFACE WATER AND SEDIMENT SAMPLING

Ten surface water and sediment samples were collected from Mirror Lake, Cold Spring Brook Pond, and Cold Spring Brook in March 2020.

– The location at Mirror Lake was collected near the beach.

– The three locations in Cold Spring Brook Pond were to assess potential impact to the pond that may have been caused by contamination associated with AOC 40.

- AOC 40 was an informal disposal area along Patton Road on the south side of Cold Spring Brook Pond. The disposed materials primarily consisted of construction debris (masonry, asphalt, wire, and metal), ash, stumps, and logs. Some drums were also found that had held antifreeze, but the drums had been painted and reused. The disposal area was remediated in 2000 through the removal of debris, contaminated soil, and contaminated sediment. The wetlands were also restored. PFAS was not a known contaminant at the time the remediation was conducted.

– Most of the locations in Cold Spring Brook were collected in areas where groundwater from the AOC 57 Area 2, AOC 57 Area 3, AOC 74, and AOC 75 are thought to be discharging to the brook/wetland.

– The results are shown on the following maps, along with previously collected samples.

CSB-18-01		
Sample	9/27/2018	9/27/2018
Units:	ng/L	ug/kg
PFBS	**1.60 J**	2.50 U
PFOS	**4.10**	6.90 U
PFOA	**4.50**	**2.50 J**

CSB-20-01		
Sample	3/27/2020	3/27/2020
Units:	ng/L	ug/kg
PFBS	**3.20**	0.370 U
PFOS	**2.20 J**	1.00 U
PFOA	**8.60**	**0.270 J**

CP-20-02		
Sample	3/27/2020	3/27/2020
Units:	ng/L	ug/kg
PFBS	**2.20**	0.230 U
PFOS	**5.50**	**0.340 J**
PFOA	**67.0**	**0.250 J**

CP-20-03		
Sample	3/30/2020	3/30/2020
Units:	ng/L	ug/kg
PFBS	**1.80**	0.270 U
PFOS	**5.70**	0.740 U
PFOA	**57.0**	**0.230 J**

CP-20-01				
Sample	3/27/2020	(3/27/2020) FD	3/27/2020	(3/27/2020) FD
Units:	ng/L	ng/L	ug/kg	ug/kg
PFBS	**2.60**	**2.60**	0.450 U	0.470 U
PFOS	**7.40**	**7.70**	**1.00 J**	**0.910 J**
PFOA	**60.0**	**54.0**	**0.400 J**	**0.310 J**

ML-20-01		
Sample	3/30/2020	3/30/2020
Units:	ng/L	ug/kg
PFBS	**1.10 J**	0.230 U
PFOS	**11.0**	0.630 U
PFOA	**12.0**	0.250 U

Legend

- Surface Water and Sediment Sample Location
- Public Water Supply Well
- Former Fort Devens Boundary

EPA PFAS Site Specific Screening Levels for Former Fort Devens			
Surface Water		Sediment	
Units:	ng/L	Units:	µg/kg
PFOA	2,030	PFOA	609
PFOS	2,030	PFOS	609
PFBS	2,030,000	PFBS	609,000

Notes:

Perfluorooctane Sulfonic Acid (PFOS)
Perfluorooctanoic Acid (PFOA)
Perfluorobutanesulfonic acid (PFBS)
ng/L = nanograms per liter (Surface Water Result Value)
µg/kg = microgram per kilogram (Sediment Result value)

J = estimated result
U= not detected above the reported sample quantitation limit
Bold = detection

Southern Extent Cold Spring Brook, Cold Spring Brook Pond, and Mirror Lake PFAS Results in Surface Water and Sediment Samples Devens PFAS RI - Area 1 PSCS

Former Fort Devens Army Installation
Devens, Massachusetts

KOMAN Government Solutions, LLC
293 Boston Post Road West, Suite 100, Marlborough, MA 01752

0 300 600
Feet

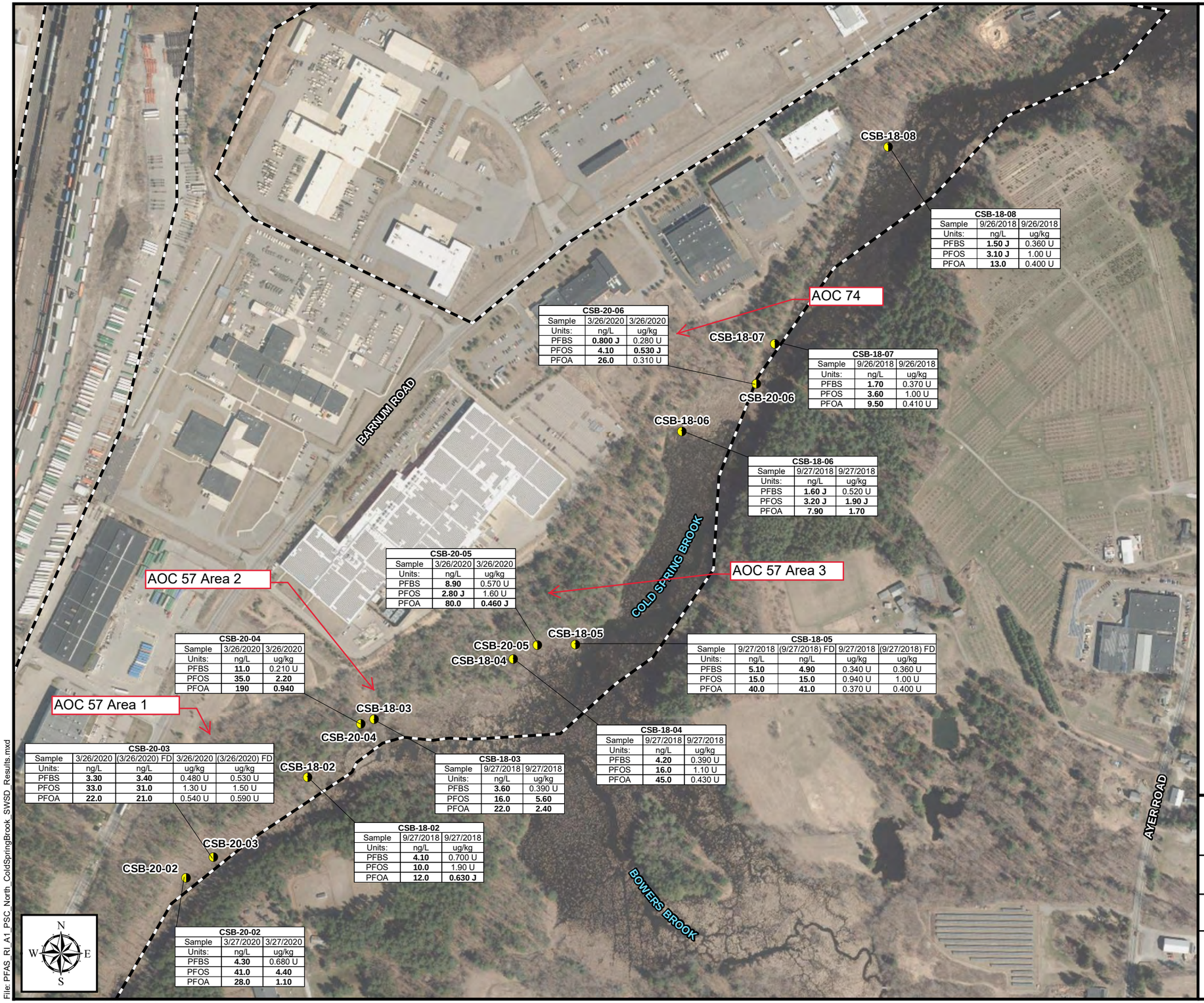
Date: 05/05/2020

Figure 7

KGS

File: PFAS_RI_A1_PSC_South_ColdSpringBrook_SWSD_Results.mxd

Aerial Sources: 2019, USGS, MassGIS



Legend

- Surface Water and Sediment Sample Location
- Former Fort Devens Boundary

EPA PFAS Site Specific Screening Levels for Former Fort Devens

Surface Water		Sediment	
Units:	ng/L	Units:	µg/kg
PFOA	2,030	PFOA	609
PFOS	2,030	PFOS	609
PFBS	2,030,000	PFBS	609,000

Notes:

Perfluorooctane Sulfonic Acid (PFOS)
Perfluorooctanoic Acid (PFOA)
Perfluorobutanesulfonic acid (PFBS)
ng/L = nanograms per liter (Surface Water Result Value)
µg/kg = microgram per kilogram (Sediment Result value)

J = estimated result
U= not detected above the reported sample quantitation limit
Bold = detection

Northern Extent Cold Spring Brook
PFAS Results in Surface Water and Sediment Samples
Devens PFAS RI - Area 1 PSCS

Former Fort Devens Army Installation
Devens, Massachusetts

KOMAN Government Solutions, LLC
293 Boston Post Road West, Suite 100, Marlborough, MA 01752

0 200 400
Feet

Date: 05/05/2020

Figure **8**

File: PFAS_RI_A1_PSC_North_ColdSpringBrook_SWSD_Results.mxd

Aerial Sources: 2019, USGS, MassGIS

SURFACE WATER AND SEDIMENT SAMPLING RESULTS

- PFAS concentrations did not exceed EPA's site-specific screening levels which are:
  - Surface water screening levels: PFOA = 2,030 ppt, PFOS = 2,030 ppt, PFBS = 2,030,000 ppt
  - Sediment screening levels: PFOA 609 µg/kg, PFOS = 609 µg/kg, PFBS = 609,000 µg/kg
- Mirror Lake (1 location)
  - Surface water: PFOA = 12 ppt, PFOS = 11 ppt, PFBS = 1.1 ppt
  - Sediment: PFAS was non-detect
- Cold Spring Brook Pond (3 locations)
  - Surface water maximum: PFOA = 67 ppt, PFOS = 5.7 ppt
- Cold Spring Brook (6 locations)
  - Surface water maximum: PFOA = 190 ppt, PFOS = 41 ppt, PFBS = 11 ppt
  - Sediment maximum: PFOA = 1.1 µg/kg, PFOS = 4.4 µg/kg, PFBS = non-detect
  - Five of the locations were positioned in areas where groundwater from the AOC 57 Area 2, AOC 57 Area 3, AOC 74, and AOC 75 are thought to be discharging to the brook. The concentrations at these locations (CSB-20-02 through -06) had higher concentrations than other samples collected in the brook. The results suggest that groundwater from AOC 57 Area 2, AOC 57 Area 3, AOC 74, and AOC 75 is discharging to the brook/wetland.
  - CSB-20-01 had low PFAS concentrations indicating a minimal impact from PFAS at this location.

PFAS RI DRILLING ACTIVITIES

Monitoring wells and piezometers were installed in numerous AOCs across Fort Devens. The piezometers are used to assess water levels. Monitoring wells are used to collect groundwater samples and to assess water levels.

Monitoring Wells

- 9 monitoring wells installed at AOC 57 Area 2
- 5 monitoring wells installed at AOC 57 Area 3
- 5 monitoring wells installed at AOC 75
- 1 monitoring well installed in the Grove Pond Area
- 1 monitoring well installed in the Shabokin well area
- 3 monitoring wells installed at AOC 43G

Piezometers

- 5 piezometers installed at AOC 74
- 7 piezometers installed at AOC 75
- 4 piezometers installed in the Shabokin well area
- 1 piezometer installed in the Patton well area

NEXT STEPS

PFAS RI
– Continue sampling efforts in Areas 1, 2, and 3 including installation of bedrock wells
– Review the Remedial Investigation data collected to date with the regulatory agencies

PFAS sampling/treatment
- Submit private well sampling results to stakeholders
- Fourth Quarter 2020 (December) sampling of municipal (Ayer) water supply wells
- Continued operation of municipal treatment system at Ayer's Grove Pond Well #8
- MassDevelopment continuing sampling and treatment at MacPherson, Patton, and Shabokin water supply wells

Community Involvement Plan
– Draft Final CIP planned for September 2020